

WHAT IS CLAIMED IS:

1. An electrode system for facilitating the healing of a wound, comprising:

a first electrode; and

a second electrode, wherein the first and the second electrodes comprise oppositely charged polymers of sufficient differential voltage potential and sufficient charge densities to cause a current to flow from the first electrode to the second electrode through the wound when the electrode system is applied to the wound.

2. The electrode system defined in claim 1 further comprising a support structure to which the first and second electrode are attached.

3. The electrode system defined in claim 2 wherein the support structure is permeable to oxygen.

4. The electrode system defined in claim 2 wherein the support structure is impermeable to water and water vapor.

5. The electrode system defined in claim 2 wherein the second electrode surrounds the first electrode on the support structure.

6. The electrode system defined in claim 5 further comprising an electrically insulative element attached to the support structure that is disposed between the first and the second electrodes.

7. The electrode system defined in claim 2 wherein the first electrode surrounds the second electrode on the support structure.

8. The electrode system defined in claim 7 further comprising an electrically insulative element attached to the support structure that is disposed between the first and the second electrodes.

9. The electrode system defined in claim 1 wherein the current that is caused to flow between the first and the second electrodes causes a current density within the range of  $1 \mu\text{A}/\text{cm}^2$  to  $10,000 \mu\text{A}/\text{cm}^2$  to occur through the area of the wound.

10. The electrode system defined in claim 1 further comprising:

a first adhesive material attached to the first electrode, wherein the first adhesive material attaches the first electrode to the wound when the electrode system is applied to the wound; and

a second adhesive material attached to the second electrode, wherein the second adhesive material attaches the second electrode to the skin surrounding the wound when the electrode system is applied to the wound.

11. The electrode system defined in claim 10 wherein the first electrode covers the entire wound when the electrode system is applied to the wound.

12. The electrode system defined in claim 1 further comprising:

a first adhesive material attached to the first electrode, wherein the first adhesive material attaches the first electrode to the skin surrounding the wound when the electrode system is applied to the wound; and

a second adhesive material attached to the second electrode, wherein the second adhesive material attaches the second electrode to the wound when the electrode system is applied to the wound.

13. The electrode system defined in claim 12 wherein the second electrode covers the entire wound when the electrode system is applied to the wound.